

# Association Between Demographic Features and Functional Disability in Patients with Chronic Low Back Pain

Farwah Batool<sup>1\*</sup>, Waqar Afzal<sup>1</sup>, Komal Tariq<sup>1</sup> and Arooj Fatima<sup>1</sup>

<sup>1</sup>University Institute of Physical Therapy, The University of Lahore, Lahore, Pakistan

\*farwahbatool6@gmail.com

## Highlights:

- ▶ Low back pain is the leading cause of disability
- ▶ Occupations have association with functional disability in chronic low back patients.
- ▶ Age, functional status, daily activity level have no association with functional disability.

## Abstract:

A lot of factors are responsible for Chronic Low Back Pain (CLBP) in which the foremost causes are addiction of smoking, posture is not anatomically corrected, back muscles are not in good conditions, area of work is not good and BMI is not according to them.

## Objective:

The objective of this study was to find out the association of demographic feature with functional disability in patients with chronic low back pain.

## Methodology:

It is descriptive cross sectional study. One hundred and three patients with chronic low back pain were selected from Allied hospital Faisalabad. Total six months were taken to complete the study. Demographical data were obtained from individuals by asking questions about occupation, their age, daily activity level as well as functional status. Modify Oswestry disability Questionnaire was used to find out the functional disability. Chi square test was used to check the association between the demographic features of patients and their functional disability.

## Results:

Subject's occupations have association with functional disability ( $P < 0.035$ ) while their age ( $P < 0.914$ ), daily activity level ( $P < 0.810$ ) and functional status ( $P < 0.678$ ) have not association with Chronic Low Back (CLB) patients.

## Conclusions:

It is concluded that from demographical feature only patient's occupation have association with functional disability in chronic low back pain.

## Key words:

Demographic features, functional disability, chronic low back

## Introduction:

Pain that last or exist further than 12 weeks are called Chronic Low Back Pain (CLBP). Lots of factors are responsible for CLBP in which the foremost causes are addiction of smoking, posture is not anatomically corrected, back muscles are not in good conditions, area of work is not good and BMI is not according to them. Occurrence of LBP is 40%-55% and 60%-65%, they manipulated pain at least once in a year. Approximately 5% of individuals who have back pain have disabling effects in their life. LBP prevalence is 80%-85%. Below 45 years LBP is the chief cause of restriction of activity. Considered as the most second reason of people to take appointments of clinics and it is much high in people with age of 25 to 55 years. Population of all ages, work-related and social groups are exaggerated by LBP. CLBP risk factors are work related, smoking, weakness of trunk muscles and furthestmost important factor is posture. The back pain which is not more than 6 weeks is considered as Acute Low Back Pain (ALBP) and is of 90% of the cases and the back pain more than 12 weeks is considered as CLBP and 2% -7% of the cases.<sup>1</sup>

Core muscles are the main group of muscles which are responsible for maintaining the upright posture, spine in a corrected angle, equilibrium of the body is also maintain by the core stability. Even though fixed elements soft

tissues and bones have some degree of involvement, but core stability principally preserved by dynamic task of muscular fundamentals.<sup>2</sup> Two types of groups are present in core stability, one is called local (confined) muscles of stabilizing. The multifidus is attached directly to all vertebral segments of lumbar region.<sup>3,4</sup> The mechanism of co-contraction is stimulated with the action of lumbar multifidus and transverse abdominis. Draw-in of the abdominals that ensues through contraction gives stability of spinal segments and keeps the spine in inoffensive zone.<sup>5</sup> Furthermore these muscles also gives defined motor control thus predominantly accountable for stability of spine.<sup>6-7</sup>

Second muscle group is named as global (comprehensive) muscles of stabilizing. Directly these muscles are not enclosed to the spine, but join the pelvis to ribs of thoracic compartment and joints of legs, therefore permitting extra spinal control. High torque is produced by these muscles to compensate the external forces which affect the spine, in this way this group of muscles are also responsible for providing spinal stability.<sup>4,6,8</sup>

Proper function of the core muscles are very important because if these muscles have normal functional they maintain the stability of the spine, decreases the stress which influence the intervertebral discs of spine and lumbar vertebrae<sup>9</sup>; therefore core muscles also termed as "natural brace".<sup>8</sup> Causes of CLBP is very complicated and number of which are unidentified.<sup>10</sup> One main reason comprises of weakening of abdominal muscles and shallow muscles of trunk.<sup>10,11</sup> Reducing CLBP and increases the mobility commonly includes strengthening of theses muscles.<sup>10</sup> One more reason of CLBP is deficient or weakening of motor control of deep muscles of trunk such as include transversus abdominis and lumbar multifidus muscle.<sup>1</sup> Through physical activities tissues of trunk muscles assure flexibility and balance of lumbopelvic region therefore alterations in activity of trunk muscles (mainly in

the transversus abdominis and lumbar multifidus) are commonly seen in low back pain patients.<sup>6</sup> Core strength guidance is focused at muscles of deep trunk training.<sup>12</sup> The reason to conduct the study is that different professionals complained about LBP because their occupation affect their biomechanics or ergonomic of their lumbar joints that leads to dysfunction so the objective of this study is to find out the association between demographic features with functional disability in CLBP patients.

### Methodology:

It is a cross sectional descriptive study. Patients were enrolled from the Allied Hospital of Faisalabad. Proper guidelines related to the study were completely given to the patients and informed consent from each patient is taken from them. Total one hundred and three patients were included. Only CLBP patients, males and females, and the age limit were 20 to 50 years. The patients who had any present or past trauma, dislocation or fracture, any type of deformity, congenital diseases, current infections, systemic disease, and pregnant females and having pregnancy were included. Standardized Modified Oswestry LBP Disability Questionnaire<sup>13</sup> was used in this study to find out the functional disability in the subjects. Demographic data of the patients were gathered with the aid of simple questions about their daily activity level, functional status and occupation. Chi square test was used to check the association between the demographic features of patients and their functional disability.

### Results:

Out of 103 respondents, 37(35.9%) males and 66(64.1%) females. Over all 26.2% of the respondents belonged to 36 to 40 years age group. Chi square test showed no association between age of respondents and function disability in CLBP ( $P < 0.914$ ). Mostly, 59(57.3%) respondents do their daily activities so; there was no association of functional status with functional disability in CLBP patients ( $P < 0.678$ ).

Variables	Frequency (%)	P value
Age		
20-25	7 (6.8%)	0.914
26-30	17 (16.5%)	
31-35	15 (14.6%)	
36-40	27 (26.2%)	
41-45	19 (18.4%)	
46-50	18 (17.5%)	
Functional Status		
Daily activities	59(57.3%)	0.678
Regular Exercise routine	44 (42.7%)	

**Table 1:** Association of age and functional status with functional disability

32(31.1%) respondents had mild and moderate daily activity level. So there was no association of daily activity level with functional disability ( $P<0.810$ ).

Variables	Frequency (%)	P value
Daily activity level		
Sedentary	32(31.1%)	0.810
Mild	32(31.1%)	
Moderate	24(23.3%)	
Vigorous	15(14.6%)	

**Table 2:** Association of daily activity level with functional disability

Respondents had different occupations but most of the respondents were housewives 26.2 % (27). 11 % (10.7) of the respondents were teachers and 16 % (15.5) of the respondents were workers who face the functional disability. Occupations in CLBP patients had affect the functional ability of individuals so; there was association of occupations with functional disability in CLBP patients ( $P<0.035$ ).

Variable	Frequency (%)	Variable	Frequency (%)	P value
Occupations				
Banker	8(7.8%)	Peon	1 (1.0%)	0.035
Businessman	2 (1.9%)	Physical trainer	1 (1.0%)	
Designer	1 (1.0%)	Policeman	2 (1.9%)	
Doctor	5 (4.9%)	Private Employee	2 (1.9%)	
Driver	1 (1.0%)	Rescue 1122	1 (1.0%)	
Electrician	1 (1.0%)	Salesman	1 (1.0%)	
Factory worker	1 (1.0%)	Shopkeeper	1 (1.0%)	
Farmer	1 (1.0%)	Student	10 (9.7%)	
Labor	1 (1.0%)	Sweeper	1 (1.0%)	
Govt.Employee	4 (3.9%)	Teacher	11 (10.7%)	
House wife	27 (26.2)	Worker	16 (15.5%)	
LHV	1 (1.0%)			
Manager	1 (1.0%)			
Nurse	2 (1.9%)			

**Table 3:** Association of occupations with functional disability

## Discussion:

This study described that occupations of respondents have linked with functional disability in CLBP. Occupation disturbs the functional activity of respondents but age, functional status and daily activity had not any link with functional disability.

Chiou *et al.*, reported that lower back muscle activity affect the person functional level. Working individuals were involved in this study in which back muscle weakness cause disturbance in individual performance so erector spinae muscle weakness have relationship with functional disability in LBP individuals ( $P<0.012$ ).<sup>14</sup> The study showed that when subjects kept on doing their jobs constantly, their lumbar muscles were affected and caused functional impairments ( $P<0.035$ ).

Jetha *et al.*, describe that age of individual in CLBP patients and in different conditions have association with dysfunction ( $P>0.007$ ). Individuals doing continuous work lead to further inability of working in LBP individuals. Working for longer duration result is temporary disability in disease patients.<sup>15</sup> This present study also described that occupations also lead to functional impairment in LBP respondents ( $P<0.035$ ) but age did not compromise the function activities of patients ( $P>0.914$ ).

Heuch *et al.*, reported that either body mass cause LBP. Eight hundred and thirty three patients were involved in this study. These individuals had complained of pain from three months.<sup>16</sup> Heuch *et al.*, further conducted a study in which they involved individual both male and female having increased weight. They measured the individual hip and waist width ratio. They revealed that individual age, their activity level, cholesterol level, educational level have not caused LBP but their body weight have risk of developing LPB ( $P<0.001$ ). These both studies results reported that body mass increase the chance of LBP.<sup>17</sup> But current study did not reported that body mass cause LBP and showed that age did not affect the patients functional abilities ( $P>0.914\%$ ).



Williams *et al.*, exposed that disability had relationship with LBP and risk factor such as chronic disease or educational system, poor ergonomic are the leading factors to LBP ( $P < 0.01$ ). Individual social economic status has effect on LBP but functional status has not. It worsens the pain intensity and ultimately leads to dysfunction.<sup>18</sup> This present study support the results of previous study as the regular exercise did not cause function disability ( $P > 0.678$ ).

Kim *et al.*, explained that different risk factor initiate disability in LBP patients. They conducted study on both gender as well. They used Quebec disability (QD) questionnaire and concluded that moderate activity level affect the person ability of working in LBP patient. So activity level have relationship with low back pain patients ( $P < 0.05$ ).<sup>19</sup> This present study also show that mild activity level in LBP patients have no influence on disability ( $P > 0.810$ ). Subjects can do their mild activity with pain.

### Conclusions:

In the case of CLBP, occupation of a person has association with functional disability instead of age, functional status as well as activities of daily living in CLBP patients.

### References:

- 1- Rozenberg S. Chronic low back pain: definition and treatment. *La Revue du Praticien*. 2008 Feb;58(3):265-72.
- 2- Aluko A, DeSouza L, Peacock J. The effect of core stability exercises on variations in acceleration of trunk movement, pain, and disability during an episode of acute nonspecific low back pain: a pilot clinical trial. *Journal of Manipulative and Physiological Therapeutics*. 2013 Oct 1;36(8):497-504.
- 3- Peng HY, Lin TB. Spinal pelvic-urethra reflex potentiation. *Biomedicine*. 2012 Jun 1;2(2):64-7.
- 4- Huang JT, Chen HY, Hong CZ, Lin MT, Chou LW, Chen HS, Tsai CT, Chang WD. Lumbar facet injection for the treatment of chronic piriformis myofascial pain syndrome: 52 case studies. *Patient Preference and Adherence*. 2014 Aug;8:1105.
- 5- Wong AY, Parent EC, Funabashi M, Stanton TR, Kawchuk GN. Do various baseline characteristics of transversus abdominis and lumbar multifidus predict clinical outcomes in nonspecific low back pain? A systematic review. *PAIN®*. 2013 Dec 1;154(12):2589-602.
- 6- Kumar SP. Efficacy of segmental stabilization exercise for lumbar segmental instability in patients with mechanical low back pain: A randomized placebo controlled crossover study. *North American Journal of Medical Sciences*. 2011 Oct;3(10):456.
- 7- Ekstrom RA, Donatelli RA, Carp KC. Electromyographic analysis of core trunk, hip, and thigh muscles during 9 rehabilitation exercises. *Journal of Orthopaedic & Sports Physical Therapy*. 2007 Dec;37(12):754-62.
- 8- Ezechieli M, Siebert CH, Ettinger M, Kieffer O, Weißkopf M, Miltner O. Muscle strength of the lumbar spine in different sports. *Technology and Health Care*. 2013 Jan 1;21(4):379-86.
- 9- Huxel Bliven KC, Anderson BE. Core stability training for injury prevention. *Sports Health*. 2013 Nov;5(6):514-22.
- 10- Lee CW, Hwangbo K, Lee IS. The effects of combination patterns of proprioceptive neuromuscular facilitation and ball exercise on pain and muscle activity of chronic low back pain patients. *Journal of Physical Therapy Science*. 2014 Feb;26(1):93-6.
- 11- Chang WD, Chang WY, Lee CL, Feng CY. Validity and reliability of wii fit balance board for the assessment of balance of healthy young adults and the elderly. *Journal of Physical Therapy Science*. 2013 Oct;25(10):1251-3.
- 12- Schilling JF, Murphy JC, Bonney JR, Thich JL. Effect of core strength and endurance training on performance in college students:

- randomized pilot study. *Journal of Bodywork and Movement Therapies*. 2013 Jul 1;17(3):278-90.
- 13- Fairbank JC, Pynsent PB. The Oswestry disability index. *Spine*. 2000 Nov;25(22):2940-53
- 14- Chiou SY, Koutsos E, Georgiou P, Strutton PH. Association between spectral characteristics of paraspinal muscles and functional disability in patients with low back pain: a cohort study. *BMJ Open*. 2018 Feb 1;8(2):e017091.
- 15- Jetha A, Besen E, Smith PM. Comparing the relationship between age and length of disability across common chronic conditions. *Journal of Occupational and Environmental Medicine*. 2016 May;58(5):485.
- 16- Heuch I, Heuch I, Hagen K, Zwart JA. Body mass index as a risk factor for developing chronic low back pain: a follow-up in the Nord-Trøndelag Health Study. *Spine*. 2013 Jan 15;38(2):133-9.
- 17- Heuch I, Heuch I, Hagen K, Zwart JA. A comparison of anthropometric measures for assessing the association between body size and risk of chronic low back pain: the HUNT study. *PloS One*. 2015 Oct 27;10(10):e0141268.
- 18- Williams JS, Ng N, Peltzer K, Yawson A, Biritwum R, Maximova T, Wu F, Arokiasamy P, Kowal P, Chatterji S. Risk factors and disability associated with low back pain in older adults in low-and middle-income countries. Results from the WHO study on global Aging and adult health (SAGE). *PLoS One*. 2015 Jun 4;10(6):e0127880.
- 19- Kim GS, Yi C, Cynn H. Factors influencing disability due to low back pain using the Oswestry Disability Questionnaire and the Quebec Back Pain Disability Scale. *Physiotherapy Research International*. 2014. Epub March.